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## LESSON OF THE MONTH

# Major Intra-abdominal Pathology Masquerading as Deep Venous Thrombosis

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### Introduction

We report two cases of non-traumatic gas gangrene of the lower limb secondary to direct spread from major intra-abdominal pathology. In each case the patient was referred for a vascular surgical opinion because of lower limb symptoms.

### Case Report

*Case one:* A 39-year-old woman with a 12 yr history Crohn's disease was being treated with a course of steroids for an inflammatory exacerbation of her disease. She presented with pain in the right calf and thigh and was admitted with a suspected deep vein thrombosis (DVT).

A venogram showed a below knee DVT with evidence of subcutaneous gas in the thigh and lower leg. She was then referred for a vascular surgical opinion. On review she was found to have surgical emphysema and gross oedema of the right thigh. All distal pulses were intact and the leg appeared viable.

A CT scan of the abdomen and pelvis showed an inflammatory mass in the right iliac fossa and subcutaneous gas (Fig. 1). There was evidence of a fistula via the sacral foramina communicating with the thigh.

At laparotomy, the caecum appeared normal but there was transmural inflammation of the terminal

ileum. A right hemicolectomy was performed and thigh fasciotomy revealed viable muscle and pus that grew mixed coliform bacilli, mixed anaerobes and streptococcus milleri.

She made a slow post-operative recovery on high dose broad spectrum antibiotics.

*Case two:* A 64-year-old woman presented with a 2 day history of right calf pain. The pain had gradually increased in severity, extending proximally from calf to thigh. Her leg had swollen dramatically over a 4 h period. On further questioning she admitted to some lower abdominal discomfort and had been prescribed iron tablets by her general practitioner two weeks previously for anaemia. On examination she was pale, tachycardic and pyrexial (37.8 °C). Her right lower limb was grossly oedematous with crepitus from groin to ankle (Fig. 2). On abdominal examination there was a mass in the right iliac fossa with surgical emphysema in the abdominal wall.

A CT of the abdomen and pelvis confirmed subcutaneous gas and the mass. Gas was also seen in the iliac vein.

Resuscitation and investigation proceeded simultaneously. She underwent further stabilization on the ICU and was transferred to theatre. Under general anaesthetic right leg fasciotomies were performed followed by a laparotomy and right hemicolectomy with end ileostomy. The mass was found to be a large caecal tumour, which had perforated posteriorly into the psoas muscle. There was no intra-abdominal contamination. The muscle in the thigh was necrotic and in view of the underlying diagnosis, the situation was deemed hopeless and palliative care was instituted. The patient died 9 h following presentation.

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**Fig. 1.** Subcutaneous gas in the lower abdominal wall.

Microbiological blood cultures were negative and tissue cultures were not taken.

### Discussion

The presence of gas forming organisms in the lower limb secondary to intra-abdominal pathology is rare but has been previously documented.<sup>1-3</sup> The source of the sepsis is usually the caecum, although a variety of other organs within the abdomen have been identified.<sup>4,5</sup> The underlying lesion within the abdomen is usually neoplastic.<sup>6,7</sup>

In these cases the causative organisms were non-clostridial (synergistic gangrene) rather than the more commonly identified clostridial gangrene.<sup>8</sup> In reality this has little impact on management, both groups requiring resuscitation, surgical debridement and appropriate high doses of broad spectrum antibiotics.<sup>9</sup>

The portal of entry of organisms into the lower limb in cases of gangrene is most commonly traumatic (including IM injections), followed by direct spread (in case one via the sacral foramen and in case two via the psoas muscle) and rarely indirect (metastatic) spread.

Patients at increased risk of developing gas gangrene are those who are immunosuppressed, particularly those with haematological malignancy,



**Fig. 2.** Gross oedema of the lower limb secondary to gas forming organisms.

and patients with diabetes.<sup>10</sup> In these patients, any ulcerated mucosal membrane may give rise to metastatic endogenous infection with gas forming organisms. It is interesting to note that blood-borne spread has a predilection for the extremities.

Unfortunately both clostridial and non-clostridial gangrene have a poor prognosis. In one review the mortality was 52% and the amputation rate 36%. The outcome of early and aggressive treatment was better than in those patients treated non-operatively.<sup>9,11</sup>

Patients presenting with gas gangrene secondary to underlying malignancy appear to have a particularly dire prognosis. Hallock's review of the literature of 12 case reports identified only one survivor.<sup>6</sup>

Quite, why the first patient survived and the second died is purely speculative. Relevant factors are likely to include age, general fitness of the patient and the presence of malignancy. Alternatively the virulence of the organisms may have been a contributing factor. The second patient was exposed to colonic flora and, therefore, a greater bacterial load in contrast to the patient with Crohn's disease who was only subject to small bowel bacteria.

Both these cases highlight the importance of taking a detailed history and performing a comprehensive examination in any patient presenting with unilateral leg oedema or 'DVT'. The clinician would do well to remember intra-abdominal pathology as a cause of lower limb oedema. Surgical emphysema is an important sign of the presence of gas forming organisms within the subcutaneous tissue. Early diagnosis and swift treatment may prevent rapid disease progression and death.

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